

# **NASA External Cost/Schedule Performance Reporting:**

Update on How Changes are being  
Folded in

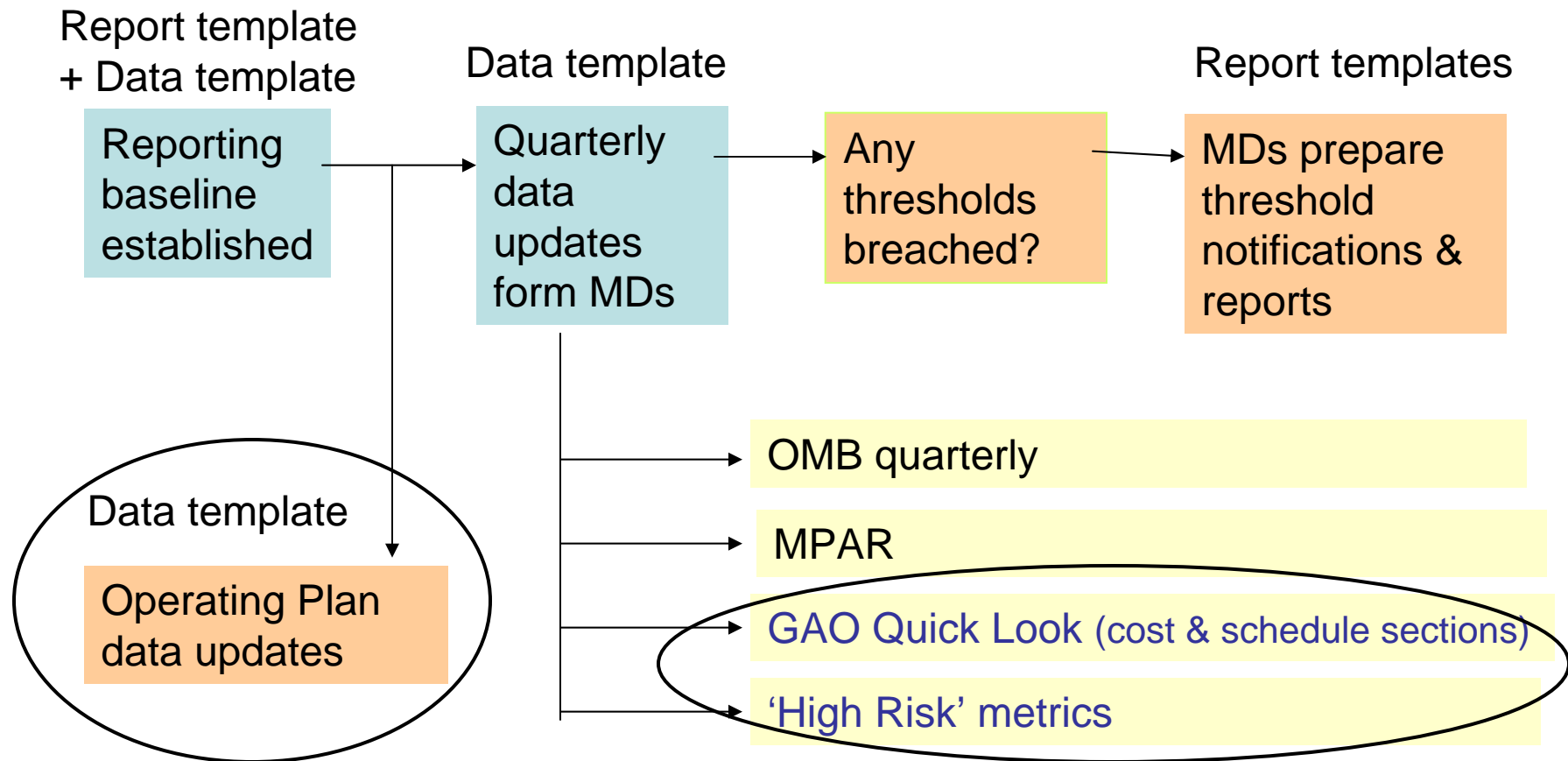
Mary Beth Zimmerman

February 24, 2009

# What's New Since the last PM Challenge?

- Two new reports
  - GAO Quick Look semi-annual reviews (Julie Pollitt's presentation covers in detail)
  - 'High Risk' Metrics for OMB (Riva Svarcas' presentation covers in detail)
- Updated NASA policies and process affecting reporting
  - Distinction between margin held by projects and that held by programs or Mission Directorates
  - Review of quarterly reports to OMB by projects and centers
  - Update of quarterly data for operating plan changes
- Distinguishing between internal and external reasons for reported cost and schedule changes.
- Reporting will continue to evolve as additional details are worked with NASA's stakeholders. Key items being refined:
  - Contract cost growth
  - Changes in content & scope
  - Confidence Levels
  - Milestone completion dates
  - Explanations of change

# Folding Changes into the Process



# Coordinated Data Management

- Integrated quarterly data call to Mission Directorates includes:
  - A common data template and guidance serves as a basis for the cost and schedule information required in annual, semi-annual, and quarterly external reports.
  - Templates for any required baseline or threshold reports.
  - Guidance for completing each.
  - New policy being worked into quarterly process: projects, centers & Mission Directorates will sign off on quarterly reports to OMB.
- Coordination of quarterly data call with other reporting elements.
  - Q1 report is coordinated with annual reporting (MPAR).
  - A GAO template is used to collect additional information on technology.
  - Lifecycle cost estimate (LCCE) changes reported in Agency Operation Plans to Congress will be based on updates to quarterly reports.
- Coordination with Agency Baseline Program Review (BPI)
  - Distinguishes between cost margin held by the project and held for the project by the Program or Mission Directorate.
  - Coordination with cost and schedule data from KDPs.
  - Data call is being transitioned from PA&E to OCE to merge with BPR data collection.

# Data Requirements

<b>Project Cost</b>	<b>Contracts</b>
Phase	Pending awards
Year	Cost growth
WBS2	<b>Explanation of Change</b>
Budget line	Changes in content
<b>Project Schedule</b>	Reasons for change
Key milestone	<b>Technical progress</b>
Interim milestones	Technical maturity
<b>Project Content</b>	Design stability
Scope	<b>Project Risk</b>
Parameters	Confidence level
Critical technologies	Backup technologies

Blue text: New since last PM Challenge

# Baseline Reports: No Changes

- Baseline Reports are prepared for projects subject to MPAR reporting to Congress or NSPD-49 reporting to OMB when:
  - A project in formulation awards contract w/ development content =>\$50M (for OMB only).
  - A project with a lifecycle cost estimate (LCCE) of \$250M or more receives KDP-C approval to enter Phase C (for OMB & Congress).
- Baseline Report includes
  - baseline numbers subject to threshold requirements.
    - Projects in development:
      - Lifecycle cost
      - Development cost
      - Key schedule milestone
    - Projects in formulation
      - Ave. contract value
  - additional information as required by Congress or OMB.
- Baseline Reports look similar to the project pages in the Agency's budget.

# Data Template

## Projects in Formulation

Expanded  
schedule  
milestone  
information for  
GAO Quick  
Look

No WBS  
elements at  
this stage

Contract  
information

NASA Formulation Cost and Contract Data Template Rev 3																																																																																																																																																																																																																																																
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# Data Template

## Projects in Development

- Filled out for:
  - Each baseline
  - Each quarter
  - Each Op Plan LCC
- Technical information is provided separately.
  - GAO Quick Look Data Collection Instrument (DCI)
  - Written reports, budget pages

NASA Development Project Cost & Schedule Data Template (Rev 5)																					
Person completing this form:					Project Name:					6-digit project code											
Budget/Op Plan assumed:					Date of Estimate:																
Current Estimated Schedule																					
Milestone	Date	Milestone	Date	Other Milestones	Date																
Start Phase A		Start Phase D																			
SRR		ORR/FRR																			
MDR/SDR (PNAR)		LRD																			
Start Phase B		Launch/IOC																			
PDR (NAR)		Start Phase E/FOC																			
Start Phase C		End Prime Mission																			
CDR		End Ex Mission																			
SIR																					
Estimated confidence level for this LCC: <input type="text"/> Current LCC Estimate at Completion: <input type="text"/> Check here if no changes from last quarter: <input type="text"/>																					
Explanation of changes to project scope, schedule, or direct costs since last update:																					
Explanations of Change goes here																					
	Prior	FY01	FY02	FY03	FY04	FY05	FY06	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14	FY15	FY16	FY17	FY18	BTC	TOTAL
Full Cost LCC by Year	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
To be completed by Mission Directorate:																					
Direct Costs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pre Formulation *																					0.0
Formulation (A, B)																					0.0
Development (C, D)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Technology Development																					0.0
Aircraft/Spacecraft																					0.0
Payload(s)																					0.0
Systems I&T																					0.0
Launch Vehicle/Services																					0.0
Ground Systems																					0.0
Science/Technology																					0.0
Other direct project cost																					0.0
Reserves*																					0.0
MO&DA - Prime (E)																					0.0
MO&DA - Extended * (E)																					0.0
Closeout (F)																					0.0
Additional reserves																					

Expanded schedule information per Quick Look reporting.

Confidence level information goes here

Explanations of Change goes here

New: 'purple line' provides for reporting of portion of cost held for projects by Programs or MDs.



# Quarterly Reports to OMB

## Development Projects (no changes)

External LCC baseline

Updated totals by quarter

% change from baseline

Accounting adjustments

Development Cost Baseline

Schedule Baseline

Baseline cost by phase, & accounting.

Current cost by phase, & accounting.

Explanation of changes

Project

Date of Estimate

Table 1: Summary

FY08

Q1

Q2

Q3

Q4

Change to

Last Rpt

Base

Base at ADP-C

Reporting Base

LCC

(\$M)

(\$M)

(\$M)

(\$M)

(\$M)

(\$M)

(\$M)

Direct

Full Cost - Unadjusted

Full Cost - Adjusted to Current Accounting

Development Cost

(\$M)

(\$M)

(\$M)

(\$M)

(\$M)

(\$M)

(\$M)

Direct

Full Cost - Unadjusted

Full Cost - Adjusted to Current Accounting

Schedule

months

months

CDR

Instrument Pre-ship Review

Launch Readiness Date

Q4 FY 2008 Cost and Schedule Update Report to OMB

Table 2: Estimated Annual Phasing (\$M)

Reporting Baseline (unadjusted)

Prior

FY02

FY03

FY04

FY05

FY06

FY07\*

FY08

FY09

FY10

FY11

FY12

FY13

FY14

FY15

FY16

FY17

FY18

BTC

TOTAL

Direct

Formulation

Development

Op/Disposal

Indirect

Full Cost

Current Quarter

Prior

FY02

FY03

FY04

FY05

FY06

FY07

FY08

FY09

FY10

FY11

FY12

FY13

FY14

FY15

FY16

FY17

FY18

BTC

TOTAL

Direct

Formulation

Development

Op/Disposal

Indirect

Full Cost

Note: Reported information & format developed with OMB.

# As Reported to OMB Formulation Projects

No project % changes  
reported

LCCE &  
schedule  
only

Project  
Date of Estimate


Q1 FY 2009 Cost and Schedule Baseline Report to OMB

Table 1: Preliminary Estimated Lifecycle Cost and Schedule for Project in Formulation\*

	OMB Base Estimate	FY08 Q1	FY08 Q2	FY08 Q3	FY08 Q4	FY09 Q1	Reason(s) for Changes from Last Quarter
<b>Estimated TDRS LCC</b>	(\$M)	(\$M)	(\$M)	(\$M)	(\$M)	(\$M)	
Direct							<div>Base value</div> <div>Current value</div>
Full Cost - Unadjusted							
Full Cost - Adjusted Base							
<b>Estimated Schedule Assumptions</b>							
LRD/IOC/FOC							

Table 2: Contracts with Development Elements

Contract Description	Provider	Project Element(s) this Supports	Base Quarter	Base Contract Value (\$M)	Last Quarter Value (\$M)	Current Contract Value (\$M)	Reason(s) for Change in Contract Value
Contract totals				\$0	\$0	\$0	
% Change from Base				0%			
% Change from Last Quarter				0%			

Note: Percent changes do not include the addition of new contracts.

Calculation of average change in  
value for those project contracts  
included quarterly reports to OMB

# Data 'rolled up' for reporting: Roll-in of 'purple line' only change.

Project Cost Estimate		Prior	FY05	FY06	FY07	FY08	FY09	BTC	TOTAL
		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Projects in Formulation or Operations need not complete the light blue cells for WBS level 2 cost breakout.</i>									
<b>Direct Costs (by Phase)</b>		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Formulation (A, B)</b>		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Pre Formulation *								0.0
	Phase A								0.0
	Phase B								0.0
<b>Development (C, D)</b>		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Technology Develop								0.0
	Aircraft/Spacecraft								0.0
	Payload(s)								0.0
	Systems I&T								0.0
	Launch Vehicle/Services								0.0
	Ground Systems								0.0
	Science/Technology								0.0
	Other direct project cost								0.0
	Project-held Dev Reserve								0.0
<b>Operations (E, F)</b>		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	MO&DA - Prime (E)								0.0
	MO&DA - Extended * (E')								0.0
	Closeout (F)								0.0
<b>Indirect costs</b>		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Program held reserves (UFE)</b>									

A

C

B

A Project UFE ('reserves')

B Program-held UFE ('reserves')

C Indirect costs

} Rolled into reported numbers on a pro-rated basis.

# Funding higher confidence level

- New 'purple line' captures unallocated future expenses (UFE) which are part of the project baseline but held by the program or MD.
- Project is expected to perform to its internal baseline (i.e., with UFE included in its plan, but not additional UFE held by program/MD).
- Programs/Mission Directorates can allocate UFE to the project if warranted without changing the reported baseline.
- Helps implement new 1000.5 NPD on Acquisition Policy.
  - Project UFE sufficient for 50% CL or as determined by Decision Authority.

Project baseline

=

Managed by project as part of its approved plan & internal baseline

+

Indirect Costs

+

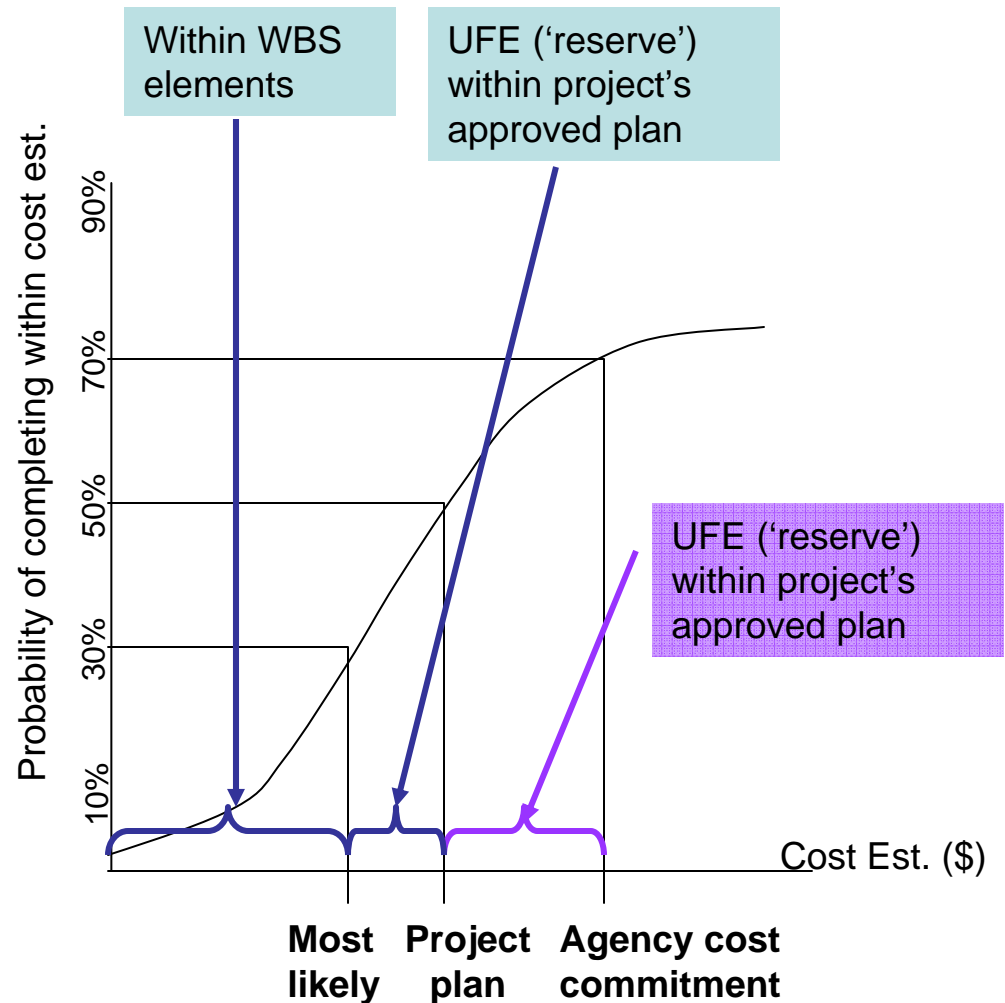
UFE held by the Program or MD

Section 4 B: Project Cost Estimate	
Project Cost Estimate	TOTAL
<b>Direct Costs (by Phase)</b>	
<b>Formulation (A, B)</b>	
Pre Formulation *	
Phase A	
Phase B	
<b>Development (C, D)</b>	
Technology Develop	
Aircraft/Spacecraft	
Payload(s)	
Systems I&T	
Launch Vehicle/Services	
Ground Systems	
Science/Technology	
Other direct project cost	
Project-held Dev UFE	
<b>Operations (E, F)</b>	
MO&DA - Prime (E)	
MO&DA - Extended * (E')	
Closeout (F)	
<b>Indirect costs</b>	
<b>Program/MD held UFE</b>	

more on UFE & confidence levels, next page

# Confidence Levels & UFE

- All projects have a range of cost estimates with differing levels of confidence.
- While it's possible to assess the additional confidence associated with higher cost estimates, it's not possible to know where within the project's WBS these costs will occur.
- Thus, they are unallocated future expenses or UFE.



# Indirect costs

FY08 PB	FY04	FY05	FY06	FY07	FY08	Total	
Full Cost	88.7	75.0	132.3	103.5	71.5	471.0	← Baseline LCC
Direct	86.4	74.6	119.8	93.3	64.2	438.4	
Labor (1000)	1.0	0.4	1.5	0.9	0.5		
Travel (2100)	0.0	0.0	0.0	0.0	0.0		
Procurements (3000)	85.3	74.3	117.5	92.3	63.6		
Service Pool (8020)	-	-	0.7	0.0	-		
Indirect	2.3	0.4	12.5	10.2	7.2	32.7	
Corporate G&A (8000)	-	-	5.6	4.4	3.0		
Prior/PY Center G&A (6551)	0.5	0.4	-	-	-		
Prior/PY Corporate G&A (6552)	1.8	-	-	-	-		
Institutional Investments (8002)	-	-	2.0	2.1	1.4		
Center M&O (8008)	-	-	4.9	3.7	2.8		

- Indirect costs were included in project budgets starting in FY04.
- FY09 budget removed indirect costs for FY07 and out.\*
- As a result, many projects have 'legacy' indirect costs still included in the 'Prior' years of their NOA runout.

\* Though still part of funds execution through the end of FY08.

# Baseline indirect cost adjustments

## Baseline LCC, originally reported

FY08 PB	FY04	FY05	FY06	FY07	FY08	Total
Full Cost	88.7	75.0	132.3	103.5	71.5	471.0
Direct	86.4	74.6	119.8	93.3	64.2	438.4

## Adjusted baseline LCC

FY08 PB	FY04	FY05	FY06	FY07	FY08	Total
Full Cost	88.7	75.0	119.8	93.3	64.2	441.1
Direct	86.4	74.6	119.8	93.3	64.2	438.4
Labor (1000)	1.0	0.4	1.5	0.9	0.5	
Travel (2100)	0.0	0.0	0.0	0.0	0.0	
Procurements (3000)	85.3	74.3	117.5	92.3	63.6	
Service Pool (8020)	-	-	0.7	0.0	-	
Indirect	2.3	0.4	-	-	-	2.7
Corporate G&A (8000)	-	-				
Prior/PY Center G&A (6551)	0.5	0.4				
Prior/PY Corporate G&A (6552)	1.8	-				
Institutional Investments (8002)	-	-				
Center M&O (8008)	-	-				

← 'Legacy' indirect costs in current accounting systems

- Apples-to-apples comparison requires adjusting the baseline to remove match the changes in indirect costs in current cost estimates.
- Direct project costs do not change as a result of these adjustments.

# No wonder cost numbers don't look familiar!

Rolled-up elements projects may not see:

- 'Legacy' indirect costs (e.g., CM&O) from the full cost years (FY04 to FY06) are included in order to be consistent with the historical budget amounts.
- Baseline submissions are updated to reflect any changes in accounting.
- UFE held for the project is included.

Also note:

- Reporting is broken out annually by the year the New Obligation Authority (NOA) is required from Congress, not the year the project expects to incur the cost.
- While cost assessments may be done in terms of constant dollars (e.g., 2008 \$), reported costs include expected inflation.



# Schedule: 7120.5D milestones

- Additional milestones required for GAO Quick Look
- We founds that milestone completion was not being interpreted the same way across the agency, or even with in the same group, resulting in some inconsistencies in dates provided.
- As a result, we have updated the guidance to include definitions for completion; as well as providing the opportunity alternative definitions for individual projects.

Milestone	Date	Milestone	Date
Start Phase A		Start Phase D	
SRR		ORR/FRR	
MDR/SDR (PNAR)		LRD	
Start Phase B		Launch/IOC	
PDR (NAR)		Start Phase E/FOC	
Start Phase C		End Prime Mission	
CDR		End Ex Mission	
SIR			

# Explanations of Change

Explanation of changes to project scope, schedule, or direct costs since last update:

- Beginning to work with MDs, Centers, and Projects to establish greater clarity in reporting. For example:
    - What factors contributed to the changed cost or schedule estimate?
    - Have been any changes to the project's budget which contributed to the change in estimates?
    - Is this a rough first estimate of changes to cost and schedule, or a partial estimate, with additional refinement to be reported later?
    - Have there been any changes to the project's scope or planned content?
    - Has any content been moved into or out of the project?
- New requirement: Distinguish between internal and external factors leading to changes in cost or schedule.

# Project contract reporting

<b>Contract Description:</b>	<b>Provider:</b>	<b>Project Element(s) this Supports</b>	<b>Current Contract Value</b>	<b>Date of Current (m/y)</b>	<b>Reason(s) for Change in Value</b>
Contract 1					
Contract 2					

- Each contract with development content is listed separately.
- Contracts are added as they are awarded.
- Changes in value reported when finalized; estimated future changes not included.
- The average growth in the value of all reported contracts for the project provides the basis for estimating contract cost growth.
- Still being worked: Specific guidance on determining which contracts require reporting and how to distinguish between changes in contract content & cost growth.

# Portfolio Cost & Schedule Reporting

- PART & PAR metrics reflect the combined performance of projects within specified themes or divisions.
- 'High Risk' Metrics reflect the combined performance of projects in development entering reporting as of 2008.
- Addressed as a weighted average of the performance of individual projects in the group.